This SED2D-WES version is in Beta test mode.
Please report problems to roig@hl.wes.army.mil.

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BETA VERSION 1.2 NOTE:

This version of SED2D is designed to work with the SMS Graphical User Interface. If you are using FastTABS you will need to convert the binary "concentration/delbed" file to a different format in order to view your results within FastTABS. A utility program call "v12_2_ft.exe" has been developed to accomplish this. This utility program will yield a solution file that FastTABS recognizes as an RMA4 file, where

concentration 1 = suspended sediment concentration (ppt),

concentration 2 = cumulative bed elevation change (feet),

concentration 3 = bed shear stress (kg/ m sec^2).

To run the program, simply type "v12_2_ft.exe<cr>", then answer the questions from the screen. If you are using SMS you can view the "concentration/delbed" file generated by SED2D directly from within SMS.

SED2D-WES Version 1.2 Beta Data Card Summary

Card	Contents	Required
T1-T3	Title Cards	T3 Yes
$D	Date of the simulation start time	No
$H	Hotstart control	Yes for hotstart
$L1	Input file control	Yes
$L2	Output file control	Yes
$M	Machine identifier	Yes
BC	Boundary Condition control	Yes
CC	Clay characteristics	Yes if Clay
CI	Clay characteristics for each layer id	Yes if Clay
CL	Clay distributor by layer	Yes if Clay
CO	Comments	No
ED	Effective diffusion	Yes
EF	Error Flags	No
END	End of time step separator	Yes
FD	Fluid density	No
FT	Fluid temperature	No
G1	Geometry, nodal coordinate scale factor	No
GC	Geometry, continuity check lines	No
GE	Grid, element connection table	No
GNN	Geometry, nodal coordinate	No
HN	Hydraulic Roughness	Yes if MSC = 2
HS	Hydraulic Bed Shear Stress	Yes
IC	Initial concentration	Yes for coldstart
PC	Point Source Control	No

PV	Physical Variables	No

SA	Sand characteristics	Yes if sand
SB	Sand bed thickness distribution by layer	Yes if sand
SR	Sand grain size for roughness	Yes if sand
ST	Sand grain size for transport	Yes if sand
SI	System international units	Yes
STOP	Stop the RMA10 simulation	Yes
TO	Timing output control of binary results	No
TR	Trace print control	No
TRE	Element list for special summary trace print	No
TRN	Nodal list for special summary trace print	No
TRT	Element type list for special trace print	No
TT	Crank-Nickolson Theta	Yes
TZ	Computation time control	Yes
WC	Fall velocity	Yes
WF	Fall velocity function	No

A "T" card must be the first user input line in the primary SED2D-WES run control file. Any number of T1 and T2 lines may be used and the sequence is not significant. Only one T3 line may be used, and it must be the last title line in the set. The program reads the '3' as meaning the END of the "t" cards.

T3 Required

Field	Variable	Value	Description
0,C1	IC1	T	Card group identifier
0,C2	IC3	1,2,3	
1	TITLE	A	Any alpha-numeric data, up to 77 characters

$D CARD **START DATE CONTROL** **$D CARD**

This data may be included for the benefit of the user to distinguish between runs. It is not used by SED2D.

Not Required

Field	Variable	Value	Description
0,C1-3	IC1	$D	Card group identifier
1	IYR	+	Last 2 integers digits of the year of simulation. Used for run identification purposes only.
2	IMO	+	Month
3	IDA	+	Day
4	IHR	+	Hour
5	IMN	+	Minute
6	ISC	+	Second

$H CARD **HOTSTART CONTROL** **$H CARD**

The parameters on this card cause the program to read a previously computed solution to use as the initial condition for the current run (HOTSTART)

Required for hotstart

Field	Variable	Value	Description
0,C1-2	IC1	$H	Card group identifier
1	KCHOT	+	Hotstart sediment concentration
		0	Do not hotstart concentration
2	KDBHOT	+	Hotstart bed change (delbed)
		0	Do not hotstart bed change
3	KBSHOT	+	Hotstart bed structure (applicable for cohesive only)
		0	Do not hotstart bed structure

NOTE: The previous run must have saved output file (see $L1 and $L2 cards) of the desired parameters.

$L1 CARD **INPUT FILE CONTROL** **$L1 CARD**

Active parameters on this card cause the program to read data from the requested file. The user will be asked to interactively supply file names for the requested files.

Required

Field	Variable	Value	Description
0,C1-3	IC1	$L1	Card group identifier
1	ING	+	GFGEN binary geometry. (Input LU= 10. No default) *See note below.*
		0	Off (GNN and GE cards required)
2	INRMA2	+	RMA2 binary hydrodynamic. (Input LU = 20. No default) This file is mandatory
3	INHOT	+	HOTSTART Concentration/Delbed binary (Input LU = 30)
		0	Off (This is the default)
4	INHOTB	+	HOTSTART Bed structure binary (Input LU = 40)
		0	Off (This is the default)
5	INFETCH	+	Wind fetch (Input LU = 50)
		0	Off (This is the default)
6	INWIND	+	Wind speed and direction (Input LU = 60)
		0	Off (This is the default)
7	INPSC	+	Point source concentration (Input LU = 70)
		0	Off (This is the default)

NOTE: One-dimensional elements are currently not supporte by SED2D-WES. Any one dimensional elements within the mesh will be modified to have material type = 0 when the geometry file is read in.

$L2-CARD **OUTPUT FILE CONTROL** **$L2 CARD**

Active parameters on this card cause the program to write data to the requested file. . The user will be asked to interactively supply file names for the requested files.

Required

Field	Variable	Value	Description
0,C1-3	IC1	$L2	Card group identifier
1	IOUT	+	Full print (Output LU = 15. This is the default)
		0	Off
2	KSPN	+	Summary node print requested via TRN-card (Output LU = 55)
		0	Off (This is the default)
3	KSPE	+	Summary element print requested via TRE-card (Output LU = 65)
		0	Off (This is the default)
4	KGEOM	+	Save new GFGEN input with new bathymetry update (Output LU = 75. This is the default)
		0	Off
5	KPU	+	Save concentraiton and del-bed solution (Output LU [binary] = 35. This is the default)
		0	Off
6	KOHOTB	+	Save bed structure solution (Output LU [binary] = 45. This is the default)
		0	Off

NOTE: A scratch file (file code NSCR = 2) is created if the parameter variable NBS is set too small to fit the problem in memory. The $M-card is controls the way this scratch file is handled.

Required

Field	Variable	Value	Description
0,C1-2	IC1	$M	Card group identifier
1	IVRSID	1	Direct access record length unlimited, and defined in terms of bytes. Examples systems are: DOS PC
		2	Direct access record length unlimited, and defined in terms of short words (2 bytes). Example systems are: Prime mini-computers
		3	Direct access record length limited to 32 bytes, and defined in teems of long words (4 bytes) Example systems are: DEC Vax
		4	Direct access defined using multiple sequential access file that are opened as required. Note that this may generate and leave many file on disc. Example systems are: APPLE MAC II under ABSOFT FORTRAN, Definicon 020 beard, DEC Vax to avoid short record lengths. HP Workstation
		5	Direct access defined for a system using 64 bit or 8 byte words and where record lengths are defined in bytes Example systems are: Cray Y-MP or Cray C90
		6	Direct access defined using multiple sequential access files that are opened as required. Note that this version does not put a period (.) in the file names. It may generate and leave many files on disc. Example systems are: CDC Cyber
		8	Same as 4 except PAUSE statement is activated MacIntosh PC

Boundary condition control, parameters may be specified by node or by continuity line number, for which sediment concentration will be specified. Initial and dynamic solutions.

Required

Field	Variable	Value	Description
0,C1-2	IC1	BC	Card group identifier
0,C3	IC3	L	Option 1: Boundary condition control, parameters specified by continuity line number for which concentration will be specified. Initial and dynamic solutions.
		N	Option 2: Boundary condition control parameter specified by node number.
1	J	+	node or continuity line number
2	SPEC (J)	+	Sediment Concentration (ppt)

NOTE: GC card must precede BCL card type.

CC CARD **CLAY CHARACTERISTICS** **CC CARD**

Active parameters on this card cause the program to use the specified parameter values in place of the default values.

Required for clay

Field	Variable	Value	Description
0,C1-2	IC1	CC	Card group identifier
1	MTCL	1	Original Krone and Partheniades equations for deposition and erosion. This is the only valid option in the present version of SED2D-WES.
2	MNCL	≥ 0 < 0	Maximum number of consolidating layers (<10) Default = 4
3	TAUCD	≥ 0 < 0	Critical shear stress for deposition Default = 0.06 newton/sq m
4	ERODCP	≥ 0 < 0	Critical shear stress for particle erosion Default = 0.06 kg/sq m/sec
5	EROCON	≥ 0 < 0	Constant for the erosion equation Default = 0.002 kg/sq m/sec

CI CARD **CLAY CHARACTERISTIC by ID** **CI CARD**

Active parameters on this card cause the program to use the specified parameter values in place of the default values.

Required for clay

Field	Variable	Value	Description
0,C1-2	IC1	CI	Card group identifier
1	IDCL	≥ 0	ID type number (#1 is freshly deposited and unconsolidated) If IDCL > MNCL (CC card) do not consolidate
2	THKTYPE	≥ 0	Typical layer thickness (m) for this id type
		< 0	Default = .03 meters
3	TAUP	≥ 0	Bed shear stress at which cohesive particles begin to erode (newtons/sq m)
		< 0	Default = 0.06 n/m^2
4	PERC	≥ 0	Erosion rate constant for particle erosion
		< 0	Default = 0.002 $kg/m^2/sec$
5	QSI	≥ 0	Bed shear stress at which cohesive layers begin to erode in mass (newtons/m2)
		< 0	Default = 0.06,.12,.41, and 3.4 for layers 1 through 4 and 3.4 (n/m^2) for layers 5 through MNCL
6	QSE	≥ 0	Bed shear stress at which cohesive at age = 1 year begin to erode in mass (n/m^2
		< 0	Default = 1.1 x QSI values (see above)
7	RHOI	≥ 0	Initial dry density of a deposit of this type of cohesive material (kg/m^3)
		< 0	Default = 90, 108, 144, and 263 for layers 1 through 4 and 402 for layers type 5 through MNCL
8	RHOE	≥ 0	The consolidated dry density of deposits of this type of cohesive material at age = 1 year.
		< 0	Default = 1.1 times default values for RHOI (above)
9	CCC	≥ 0	Consolidation coefficient relating the change from RHOE and QSE to time in years
		< 0	Default = 256 kg/m^2

NOTE: Values of the variables in Fields 5-8 vary widely among sediment types. The default values may be wrong for a given sediment. ID types are numbered such that the highest number is the deepest core.

NOTE: CC card should precede CI cards.

CL CARD **CLAY DISTRIBUTION BY LAYER** **CL CARD**

Active parameters on this card cause the program to use the specified parameter values in place of the default values.

Required for clay

Field	Variable	Value	Description
0,C1-2	IC1	CL	Card group identifier
C3		b/	Option 1: Global assignment to all nodes, starting with = J
		T	Option 2: Explicit assignment for IMAT J
		E	Option 3: Explicit assignment for Element J
		N	Option 4: Explicit assignment for Node J
1	J	+	Starting or explicit value
2	LAYER	+	Layer number to be applied to J
3	ITYPE	+	Layer ID type (see CI-card)
4	THICKL	≥ 0	Layer thickness (m)
		< 0	Default value from CI card used
5	AGE	≥ 0	Layer age (years)
		< 0	Default = 0.0

NOTE: Layer numbers are arranged such that the highest number is the first to erode.

NOTE: CI cards should precede CL cards.

CO CARD **COMMENTS** **CO CARD**

Comments may be supplied on this card anywhere within the run control input, except as the first card.

Not required

Field	Variable	Value	Description
0,C1	IC1	CO	Card group identifier
1	FLD	A	Any alpha-numeric data, up to 77 characters

NOTE: Comments may be incorporated on the same line as the END-card

ED CARD **EFFECTIVE DIFFUSION COEFFICIENT** **ED CARD**

Required

Field	Variable	Value	Description
0,C1-2	IC1	ED	Card group identifier
0,C3	IC3	b/	Option 1 Global: Starting with node = J
		T	Option 2 Explicit by material type = J
		E	Option 3: Explicit assignment for Element = J
		N	Option 4: Explicit assignment for Node = J
1	J	+	Starting or explicit value
2	DIF (J,1)	≥ 0	Turbulent exchange coefficient in X direction (X plane). (units = m^2/sec)
		< 0	Default = 0.0
3	DIF (J,2)	≥ 0	Turbulent exchange coefficient in Y direction (Y plane). (units = m^2/sec)
		< 0	Default = 0.0

EF CARD **ERROR FLAGS** **EF CARD**

Not required

Field	Variable	Value	Description
0,C1-2	IC1	EF	Card group identifier
2	IHYDOPT	1	The hydrodynamic flow field is "adjusted" during the SED2D run such that as the bed moves up and down the depth of flow is changed and the velocities are changed to preserve the same unit flow as was calculated by RMA2. **This option is NOT recommended** and is supplied here only to be consistent with earlier versions of STUDH. Two types of errors occur when using this option 1) the flow field is no longer a true solution to the shallow water equations, and thus mass is not conserved according to the finite element formula; 2) as sediment deposits in backwater areas this adjustment will cause velocities to increase over the sediment bed which may artificially reduce the rate of deposition, or even erode the newly deposited bed.
		0	No adjustment of the hydrodynamic solution is performed during the SED2D run. The implicit assumption of the model is that the change in the bed geometry is small enough that it does not significantly affect the flow field. When significant erosion or deposition does occur, the user should stop the SED2D run and rerun RMA2 using the new bed geometry generated by SED2D. (See the definition of DEPLIMIT below to establish a stopping criterion). This is the default value.
3	DEPLIMIT	≥ 0	Execution of the program is stopped when the bed change (due to either erosion or deposition) at any node exceeds DEPLIMIT*(the water column depth at that node). This check prevents the user from continuing to caculate the sediment transport based on a hydrodynamic solution that is not valid for the current bed geometry. When this criterion is exceed the user should re-run RMA2 using the new bed geometry generated by SED2D.
		< 0	Default = 0.25

NOTE: If no EF card is present the default values will be assigned.

END CARD **END OF TIME STEP SEPERATION** **END CARD**

This card signals the end of boundary input for a given time step.

Required

Field	Variable	Value	Description
0,C1-2	IC1	EN	Card group identifier
0,C3	IC3	D	Card group identifier
1-10	ENDCOM	A	May be used for comments

FD CARD **FLUID DENSITY** **FD CARD**

Not required

Field	Variable	Value	Description
0,C1-2	IC1	FD	Card group identifier
0,C3	IC3	b/	Option 1: Global assignment to all nodes, starting with = J
		T	Option 2: Explicit assignment for IMAT = J
		E	Option 3: Explicit assignment for Element = J
		N	Option 4: Explicit assignment for Node = J
1	J	+	Starting or explicit value
2	RHO (J)	≥ 0	Fluid Density at location J (units = kg/m^3)
		< 0	Default = 1000.00 kg/m^3

NOTE: If no FD card is present the default value will be assigned globally.

FT CARD **FLUID TEMPERATURE** **FT CARD**

Not required

Field	Variable	Value	Description
0,C1-2	IC1	FT	Card group identifier
0,C3	IC3	b/	Option 1: Global assignment to all nodes, starting with = J
		T	Option 2: Explicit assignment for IMAT = J
		E	Option 3: Explicit assignment for Element = J
		N	Option 4: Explicit assignment for Node = J
1	J	+	Starting or explicit value
2	WTC	≥ 0	Fluid temperature in degrees centigrade at location J
		< 0	Default = 10 degrees centrigrade

NOTE: If no FT card is present the default value will be assigned globally.

G1 CARD **GEOMETRY, NODAL SCALE FACTOR** **G1 CARD**

Not required

Field	Variable	Value	Description
0,C1-2	IC1	G1	Card group identifier
1	XSCAL:E	> 0 ≤ 0	Scale factor for X coordinate input Default = 1.0
2	YSCALE	> 0 ≤ 0	Scale factor for Y coordinate input Default = 1.0

NOTE: If no G1 card is present, the default values will be applied.

GC CARD **GEOMETRY, CONTINUITY CHECK LINES** **GC CARD**

Code corner nodes only. Code all lines in the same direction. The lines will be numbered (J = 1, number of lines) according to their order of appearance in this file.

Automatic caculation of the sediment flux across a continuity check line is not available in current version of SED2D-WES. At some future date the capability will be added to calculate flux at up to MCC lines across part or all the grid with up to MCCN nodes per line. The flux through the first continutiy check line that is specified will be used as a reference load for all subsequent continuity lines (as in RMA2). Code all lines in the same direction to ensure a consistent sign for the flux direction. . In general, code left to right when facing downstream.

Not required

Field	Variable	Value	Description
0,C1-2	IC1	GC	Card group identifier
1	NNL	+	Number of corner nodes to be specified in this continuity line.
2 to NNL plus 1	Line (J,K)	+	List of corner nodes which define line segments for automatic generation of boundary conditions (K = 1, NNL).

NOTE: If a continuation line is necessary, start the next corner node in field1 of the next GC card.

GE CARD **GRID, ELEMENT CONNECTION TABLE** **GE CARD**

The element connection table will usually be provided by the GFGEN pre-processor and will reside on logical unit ING on the $L1-card. If so, omit GE and GNN cards.

Not required

Field	Variable	Value	Description
0,C1-2	IC1	GE	Card group identifier
1	J	+	Element number
2-9	NOP (J,K)	+	Up to 8 node numbers for element J, listed counterclockwise around the element starting from any corner.
10	IMAT (J)	+	Element material type
11	TH (J)	+	Direction of eddy viscosity tensor in RMA2. Optional, may be specified on the GV card. Radians, counter-clockwise from the X-axis. For 1D elements, the direction is automatically alligned with the orientation of the 1D element

NOTE: Use GE and GNN cards only to create simple grids for model testing. SED2D-WES does not contain grid generation or band width optimization routines.

The coordinate values read from the above input are multiplied by the appropriate scale factors, XSCALE and ZSCALE from the G1 card, and should result in the proper X and Y coordinates (units are determined by the SI card) after transformation.

Not required

Field	Variable	Value	Description
0,C1-2	IC1	GN	Card group identifier
0,C3	IC3	N	Card group identifier
1	J	+	Node number
2	CORD (J,1)	+	The X node coordinate (m or ft).
3	CORD (J,2)	+	The Y nodal coordinate (m or ft)
4	ELEV (J)	+	The bottom elevation at node J (m or ft)

NOTE: Use GE and GNN cards only to create simple grids for model testing. SED2D-WES does not contain grid generation or band width optimization routines.

HN CARD **HYDRAULIC ROUGHNESS (N-Value)** **HN CARD**

Required for MSC = 2 (see HS card)

Field	Variable	Value	Description
0,C1-2	IC1	HN	Card group identifier
0,C3	IC3	b/	Option 1: Global assignment to all nodes, starting with = J
		T	Option 2: Explicit assignment for IMAT = J
		E	Option 2: Explicit assignment for Element = J
		N	Option 2: Explicit assignment for Node = J
1	J	+	Starting or explicit value
2	XNVALU (J)	≥ 0	Manning's n-value for location J
		< 0	Default = 0.0

SED2D-WES applies Manning's n-values by node. The node will retain the n - value it receives from the last HN card that affects that node.

HS CARD **HYDRAULIC RED SHEAR STRESS** **HS CARD**

Required

Field	Variable	Value	Description
0,C1-2	IC1	HS	Card group identifier
1	MSC		Code the option number for shear stress computation
		1	Log-velocity distribution for a smooth wall (This is the default)
		2	Manning equations (HN-cards are required)
		3	Wave shear stress by ACKRSHR. Wind direction, speed, and wind fetch must be specified in INWIND and INFETCH files (see $L1 card). See subroutine JONFW for descriptions of these files.

Required for coldstart

Field	Variable	Value	Description
0,C1-2	IC1	IC	Card group identifier
0,C3	IC3	b/	Option 1: Global assignment to all nodes, starting with = J
		T	Option 2: Explicit assignment for IMAT = J
		E	Option 2: Explicit assignment for Element = J
		N	Opiton 2: Explicit assignment for Node = J
1	J	+	Starting or explicit value
2	CONC (J)	≥ 0	Initial suspended sediment concentration for location = J (kg/m^3)
		< 0	Default = 0.0 kg/m^3

PC CARD **POINT SOURCE CONTROL** **PC CARD**

Not required

Field	Variable	Value	Description
0,C1-2	IC1	PC	Card group identifier
1	NSRC		Point source control
		≥ 0	Number of point sources (supply point source data file in file INPSC - see $L1 card)
		< 0	Default = 0

NOTE: The format of the INPSC file is (I10,F10.0), where the integer is the element where the source is located and the real variable is the mass load of the source in kg over the time step. Specify one source per line, and NSRC lines per time step.

Active parameters on this card cause the program to use the specified parameter values in place of the default values.

Not required

Field	Variable	Value	Description
0,C1-2	IC1	CA	Card group identifier
1	ACGR	≥ 0 < 0	Acceleratrion due to gravity (m/sec2) Default = 9.807 m/sec^2

SA CARD **SAND CHARACTERISTICS** **SA CARD**

Active parameters on this card cause the program to use the specified parameter values in place of the default values.

Required for sand

Field	Variable	Value	Description
0,C1-2	IC1	SA	Card group identifier
1	MTC	7	Ackers-White transport function. This is the only option available in the current version of SED2D-WES.
2	SACLL	≥ 0 < 0	Minimum sand grain size for NSACI Default = 0.0625 mm. *See note below.*
3	SACUL	≥ 0 < 0	Maximum sand grain size for NSACI Default = 0.0625 mm. *See note below.*
4	NSACI	+	Class number. The class interval is calculated for the log of particular sizes. *See note below.*
5	SGSA	≥ 0 < 0	Specific gravity of sand grains Default = 2.65
6	GSF	≥ 0 < 0	Grain shape factor Default = 0.67
7	CLDE	≥ 0 < 0	Characteristic length factor for deposition Defualt = 1 times the depth
8	CLER	≥ 0 < 0	Characteristic length factor for erosion Default = 10 tmes the depth

NOTE: The current version of SED2D-WES handles only one size class. Therefore NSACI must equal 1, and SACLL must equal SACUL. A multiple grain size algorithm is under development.

SB CARD **SAND BED THICKNESS** **SB CARD**

Required for sand

Field	Variable	Value	Description
0,C1-2	IC1	SB	Card group identifier
C3	IC3	b/	Option 1: Global assignment to all nodes, starting with = J
		T	Option 2: Explicit assignment for IMAT = J
		E	Option 3: Explicit assignment for Element = J
		N	Option 4: Explicit assignment for Node = J
1	J	+	Starting or explicit value
2	TTHICK(J)	≥ 0	Sand bed thickness in meters
		< 0	Default = 0.0 m

SR CARD **SAND GRAIN SIZE FOR ROUGHNESS** **SR CARD**

Required for sand

Field	Variable	Value	Description
0,C1-2	IC1	SR	Card group identifier
0,C3	IC3	b/	Option 1: Global assignment to all nodes, starting with = J
		T	Option 2: Explicit assignment for IMAT = J
		E	Option 2: Explicit assignment for Element = J
		N	Option 2: Explicit assignment for Node = J
1	J	+	Starting or explicit value
2	EFDR(J)	≥ 0	Effective grain size for roughness (mm)
		< 0	Value of SACLL from SA card will be used

NOTE: SA card must precede SR card.

ST CARD **SAND GRAIN SIZE FOR TRANSPORT** **ST CARD**

Required for sand

Field	Variable	Value	Description
0,C1-2	IC1	ST	Card group identifier
0,C3	IC3	b/	Option 1: Global assignment to all nodes, starting with = j
		T	Option 2: Explicit assignment for IMAT = J
		E	Option 2: Explicit assignment for Element = J
		N	Option 2: Explicit assignment for Node = J
1	J	+	Starting or explicit value
2	EFDT(J)	≥ 0	Effective grain size for transport (mm)
		< 0	Value of SACLL from SA card will be used

NOTE: SA card must precede ST card.

SI CARD **SYSTEM INTERNATIONAL UNITS** **SI CARD**

Required

Field	Variable	Value	Description
0,C1-2	IC1	SI	Card group identifier
1	METRIC		Units for binary input.
		0	The GFGEN binary geometry file and the RMA2 binary solution file are expected to be in English units. The data from these files will be converted to metric units upon being read. Other parameters specified on cards should be input according to the units specified in this manual. SED2D-WES output will be in Metric units, except for the new GFGEN geometry created on unit KGEOM (see the $L2 card). The KGEOM file will revert to English units if METRIC = 0.
		1	The GFGEN binary geometry file and the RMA2 binary solution file are expected to be in Metric units. Other parameters specified on cards should be input according to the units specified in this manual. SED2D-WES output will be in Metric units.

STOP CARD **STOP THE STUDH SIMULATION** **STOP CARD**

Required

Field	Variable	Value	Description
0,C1-2	IC1	ST	Card group identifier
0,C3	IC3	0	Card type identifier
2-10	FLD	A	May be used for comments

TO CARD **TIMING OF BINARY PRINTOUT** **TO CARD**

Not required

Field	Variable	Value	Description
0,C1-2	IC1	TO	Card group identifier
1	IWBIN	≥ 0	Increment for printing to binary output files (print every IWBIN'th time step). Files affected include KOHOTB, KPU, and KGEOM - see $L2 card)
		< 0	Default = 1

TR CARD **TRACE PRINT CONTROL** **TRCARD**

Not required

Field	Variable	Value	Description
0,C1-2	IC1	TR	Card group identifier
1	IECHO	≥ 0	Echo the run control input cards (This is the default)
		< 0	Do not echo the run control input cards
2	ITRINC	> 0	Increment for printing to full print output file (print every ITRINC'th time step)
		≤ 0	Default = 1
3	ITRC	0	No trace printout for debug purposes (This is the default)
		1	Trace between major subroutine calls for debug purposes
		2	Exhaustive debug printout

NOTE: If no TR card is present the default values will be applied.

TRE CARD **ELEMENT LIST FOR SPECIAL SUMMARY TRACE PRINT** **TRE CARD**

Field	Variable	Value	Description
0,C1-3	IC1	TRE	Card group identifier
1-10	NESPRT(I)	+	List of element numbers for special print summary. Auto count of total number of elements = JESPRT

NOTE: Multiple TRE cards may be required to enter all requested elements.

TRN CARD **NODE LIST FOR SPECIAL SUMMARY TRACE PRINT** **TRN CARD**

Not required

Field	Variable	Value	Description
0,C1-3	IC1	TRN	Card group identifier
1-10	NNSPRT(I)	+	List of node number for special print summary. Auto total = JNSPRT

NOTE: Multiple TRN cards may be required to enter all requested nodes.

Special node printout is not implemented in the current version of SED2D-WES. An algorithm for this option is under development.

TRT CARD **ELEMENT TYPE LIST FOR SPECIAL SUMMARY TRACE PRINT** **TRT CARD**

Not required

Field	Variable	Value	Description
0,C1-3	IC1	TRT	Card group identifier
1-10	ESPLPT(I)	+	List of element type (IMAT) numbers for special print summary. Note: This will become an equivalent TRE card list.

NOTE: Mulitple TRN cards may be required to enter all requested nodes.

Special element type printout is not implemented in the current version of SED2D-WES. An algorithm for this option is under development.

TT CARD **CRANK-NICHOLSON THETA** **TT CARD**

Required

Field	Variable	Value	Description
0,C1-2	IC1	TO	Card group identifier
0,C3	IC3	b/	
1	TETA		Crank-Nickolson THETA
		> 0	A value between zero and one (0.66 is recommended)
		≤ 0	Default = 0.5 This produces the most sensitive model response but often causes oscillations in the solution.

TZ CARD **COMPUTATION TIME CONTROL** **TZ CARD**

Required

Field	Variable	Value	Description
0,C1-2	IC1	TZ	Card group identifier
3	NTTS	≥ 0 < 0	Maximum number of cycles Default = 0
1	DT	≥ 0	Length of a time step for SED2D-WES simulation (decimal hours). **Note:** The capability exists to specify a time step that is different from the RMA2 time step when using a dynamic RMA2 solution file. However, this is **NOT RECOMMENDED.** If the SED2D time step is less than the RMA2 time step then a linear interpolation will be performed to evaluate the velocities at the intermediate time steps. The SED2D time step cannot be larger than the RMA2 time step. **WARNING: It is highly recommended that the SED2D time step be set exactly equal to the RMA2 time step.** Severe accuracy errors can result from using an interpolated flow field.
		< 0	Default = 0.0
2	TMAX	≥ 0 < 0	Maximum time for a simulation (decimal hours) Default = 0.0
4	DT_REPEAT	≥ 0	Time increment for RMA2 solution file rewind (decimal hours). When using a repeating hydrodynamic solution (such as a repeating tide or a steady state hydrodynamic solution) the time increment between the last time step in the RMA2 solution file and the first time step of the rewound RMA2 solution file must be specified. For steady state hydrodynamics let DT_REPEAT = TMAX to avoid re-reading the RMA2 file every time step.
		< 0	Default = DT

WC CARD **SETTLING VELOCITY** **WC CARD**
(used for both Sand and Clay)

Required

Field	Variable	Value	Description
0,C1-2	IC1	WC	Card group identifier
0,C3	IC3	b/	Option 1: Global assignment to all nodes, starting with = J
		T	Option 2: Explicit assignment for IMAT = J
		E	Option 2: Explicit assignment for Element = J
		N	Option 2: Explicit assignment for Node = J
1	J	+	Starting or explicit value
2	VS(J)	≥ 0	Settling velocity (m/sec)
		< 0	Default = 0.0

WF CARD **SETTLING VELOCITY FUNCTION OPTION** **WF CARD**
(used for both Sand and Clay)

Not required

Field	Variable	Value	Description
0,C1-2	IC1	WF	Card group identifier
1	MSETV	0	Use WC cards alone to define fall velocity.

		1	Make fall velocity a function of concentration. The functional form is
			If concentration is greater than or equal to 1 kg/m^3 then
			VS(NN) = VS(NN) from WC cards
			If concentration is greater than or equal to 0.01 kg/m^3 & less than 1 kg/m^3 then
			VS(NN) = VS(NN) from WC cards * CONC(NN) ** (4/3)
			If concentration is less than or equal to 0.01 kg/m^3 then
			VS(NN) = 0.02158 * VS(NN) from WC cards * SQRT(CONC(NN))